

Elements → on the periodic table

Compounds → made from chemically combining two or more elements

Molecule → ^① two or more ^{of the same} elements combined together (O_2 , O_3 , H_2)

② two or more different elements combined together → smallest unit of a compound
($NaCl$, SiO_4 , CH_4)

• Density Lab:

Elements → Copper (Cu), Iron (Fe)

Compounds → Salt ($NaCl$), Sand (SiO_4)
Water (H_2O) (?)

• Separating Mixtures:

- By physical processes → heat, cool, filter, etc.

- Can every mixture be separated?

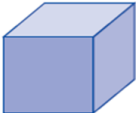
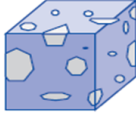
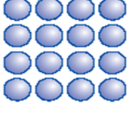
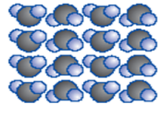
YES

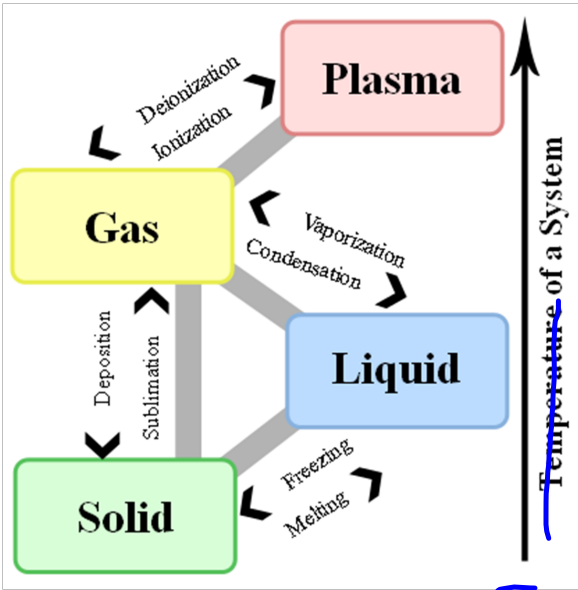
• Separating Compounds:

- By chemical processes

- Can all compounds be separated?

YES

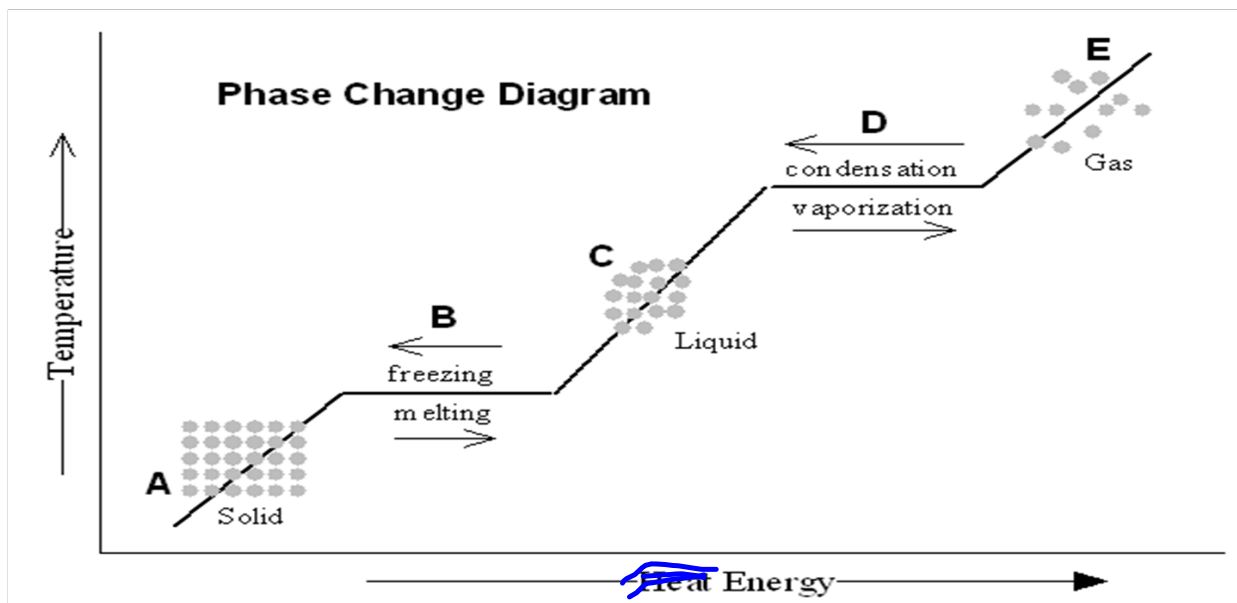
Types of Matter			
			
Homogeneous mixture	Heterogeneous mixture	Element	Compound
Type of matter	Definition		Examples
Homogeneous mixture	A mixture that contains more than one type of matter and is the same throughout.		soda pop, air, chocolate ice cream
Heterogeneous mixture	A mixture that contains more than one type of matter and is not the same throughout.		chicken soup, soil, fudge ripple ice cream
Element	A substance that contains only one type of atom.		copper metal, oxygen gas, liquid nitrogen
Compound	A substance that contains more than one type of atom.		table salt, rust (iron oxide), carbon dioxide gas



Temperature
measures
Energy

BEC

Energy of
individual atoms



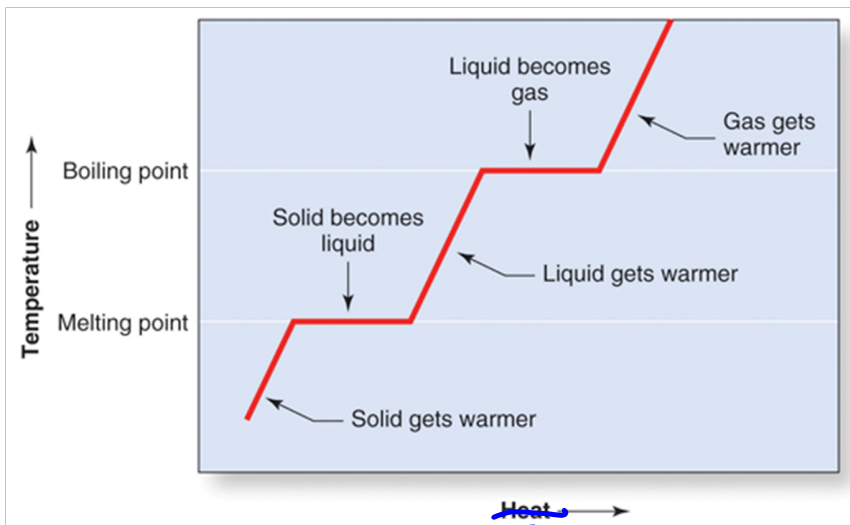
A: all particles (elements or molecules) are solid

B: some particles are solid, some are liquid

C: all particles are liquid

D: some particles liquid, some are gas

E: all particles are gas



Melting point \rightarrow solid/liquid point

Boiling point \rightarrow liquid/gas point

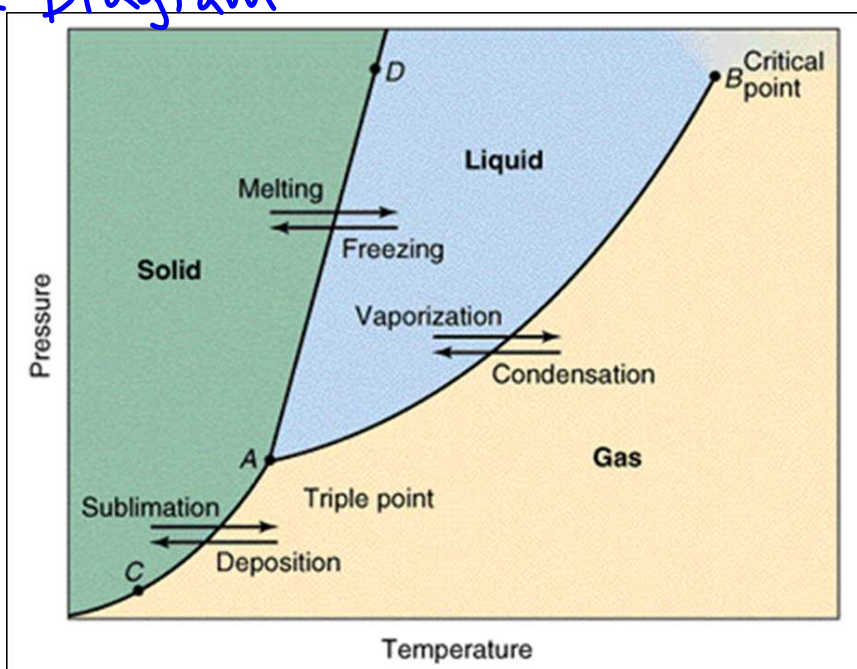
Melting point of water $\rightarrow 32^{\circ}\text{F}$, 0°C
(and freezing)

273 K

Boiling point of water $\rightarrow 212^{\circ}\text{F}$, 100°C ,
(and condensing)

373 K

Phase Diagram



Every substance has its own phase diagram.